

## ABSTRACT

A bymixer device and method which provides fast-response, accurate measurements of mixed inspired and/or expired gas fractions in open or closed ventilation circuits and/or in circle circuits used in anesthesia and/or critical care. The

5 bymixer device may include a main flow channel and a bypass flow channel. The bypass flow channel includes a flow-restrictor (e.g, an orifice) that partially blocks the flow of respiratory gas through the bypass flow channel, a mixing chamber positioned upstream of the flow restrictor and a sampling apparatus (e.g., a port for withdrawing samples of gas from said mixing chamber and/or sensor(s) positioned within the

10 mixing chamber).